

REMARKS

Election/Restrictions

During a telephone conversation with the Examiner on March 11, 2002, to discuss the restriction requirement of the Examiner under 35 U.S.C. § 121, Mr. Bernadicou had made a provisional election, with traverse, to prosecute the invention of Group I, claims 1-12, drawn to apparatus, classified in class 216.

Consequently, the Examiner had withdrawn the invention of Group II, claims 13-20, drawn to method, classified in class 438, under 37 C.F.R. 1.142 (b), as being drawn to a non-elected invention.

In response to the request by the Examiner in the Office Action mailed on July 16, 2002, Applicant hereby affirms the election to prosecute Group I claims, claims 1-12.

Claim rejections - 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 4-5, under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Examiner has further rejected claims 6-12, under 35 U.S.C. § 112, second paragraph, for insufficient antecedent basis for the limitation in the claim.

Applicant has amended claims 1, 3-4, 7-8, and 10-11 to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim Rejections 35 U.S.C. § 102 (e)

The Examiner has rejected claims 1-5 and 12 under 35 U.S.C. §102 (e) as being anticipated by Hijzen et al. (US 6,368,921).

Applicant respectfully disagrees with the Examiner. Claim 1, as amended, of Applicant's claimed invention claims a structure (7a) comprising a first pair of features (16a) disposed in a substrate and left exposed, said first pair of features (16a) being equidistant from a first centerline (17a); a second pair of features (16b) disposed in said substrate and left embedded below a layer of material (40), said second pair of features (16b) being equidistant from a second centerline (35a); and a third pair of features (46a) disposed in said layer of material (40), said third pair of features (46a) being equidistant from a third centerline (55a), wherein deviation among said first (17a), second (35a), and third (55a) centerlines is a measurement of overlay. See Figure 3 (b).

The Examiner has not explained which portions of the structure in Figure 9 of Hijzen et al. teach the first pair of features, the second pair of features, and the third pair of features that are claimed in claim 1 of Applicant's claimed invention. The Examiner refers to the silicon nitride mask (51) and the semiconductor body surface (10a) as the first pair of features. See Figure 9. Next, the Examiner refers to the dielectric layer (17) as the second pair of features. See figure 9. However, the Examiner also refers to the same dielectric layer (17) as the third pair of features. See figure 9. See second paragraph of item 6 on page 4 of the Office Action dated July 16, 2002.

The Examiner has also not explained which portions of the structure in figure 9 of Hijzen et al. teach the first centerline, the second centerline, and the third centerline that are claimed in claim 1 of Applicant's claimed invention. Hijzen et al. teaches literally hundreds of cells that are electrically in parallel, as opposed to being

electrically in series, between the two electrodes 23 and 24. See Figure 8 and Col. 4, lines 1-3.

The Examiner also states that Hijzen et al. teaches the post-etch overlay of claim 2, the post-develop overlay of claim 3, the exposed-to-embedded offset in overlay of claim 4, the correction of post-develop overlay to predict post-etch overlay of claim 5. Applicant has not found any such teaching by Hijzen et al. The Examiner seems to be referring to develop bias and etch bias, but such concepts relate to critical dimension (CD) for one layer, and not to overlay between two layers.

The Examiner further states that Hijzen et al. teaches the parallel relationship among the first pair, second pair, and third pair of overlay bars of claim 12. Applicant is unable to find any such teaching from Hijzen et al. On the contrary, Hijzen et al. teaches that no plan view of the cellular geometry is shown in the drawings because the methods of Figures 1-9 may be used for quite different, known cell geometries, such as square, close-packed hexagonal, or elongate stripe. Furthermore, Hijzen et al. teaches that, **in each case**, the trench (20), with its gate (11), extends **around** the boundary of each cell (emphases added). See Col. 3, lines 60-67. Figure 9 only shows a cross-sectional (elevation) view. Thus, it is entirely possible and consistent that the trench-gates (11), are, in fact, never parallel when seen in a plan view.

Thus, the cited reference of Hijzen et al. does not anticipate claims 1-5 and 12 of Applicant's claimed invention since Hijzen et al. does not teach each and every element of Applicant's claimed invention.

In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 1-5 and 12 under 35 U.S.C. §102 (e).

Claim Rejections 35 U.S.C. § 102 (b)

The Examiner has rejected claims 1-5 and 12 under 35 U.S.C. §102 (b) as being anticipated by Morikawa (US 5,308,682).

Applicant respectfully disagrees with the Examiner. Claim 1, as amended, of Applicant's claimed invention claims a structure (7a) comprising a first pair of features (16a) disposed in a substrate and left exposed, said first pair of features (16a) being equidistant from a first centerline (17a); a second pair of features (16b) disposed in said substrate and left embedded below a layer of material (40), said second pair of features (16b) being equidistant from a second centerline (35a); and a third pair of features (46a) disposed in said layer of material (40), said third pair of features (46a) being equidistant from a third centerline (55a), wherein deviation among said first (17a), second (35a), and third (55a) centerlines is a measurement of overlay. See Figure 3 (b).

The Examiner has not explained which portions of the structure in Figure 4c of Morikawa teach the first pair of features, the second pair of features, and the third pair of features that are claimed in claim 1 of Applicant's claimed invention. The Examiner refers to the second pair of features as number 37a and 37b and the third pair of features as number 37c and 37d. See second paragraph of item 7 on page 5 of the Office Action dated July 16, 2002. However, to the Applicant, numbers 37a, 37b, 37c, and 37d all seem to be identical to each other.

The Examiner has also not explained which portions of the structure in figure 4c of Morikawa teach the first centerline, the second centerline, and the third centerline that are claimed in claim 1 of Applicant's claimed invention.

Thus, the cited reference of Morikawa does not anticipate claims 1-5 and 12 of Applicant's claimed invention since Morikawa does not teach each and every element of Applicant's claimed invention.

In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 1–5 and 12 under 35 U.S.C. §102 (b).

Claim Rejections 35 U.S.C. § 103 (a)

Claims 6-8

The Examiner has rejected claims 6-8 under 35 U.S.C. §103 (a) as being unpatentable over Hijzen et al. (US 6,368,921) in view of Farrar (US 6,413,827).

Applicant respectfully disagrees with the Examiner. Overlay refers to the relative placement of a subsequent layer with respect to a previous layer. See lines 8-9 on page 3 of the specification. For illustrative purposes, the specification chose the polysilicon gate layer (40) as the subsequent or second layer and the shallow trench isolation layer (20) as the previous or first layer. See lines 12-14 on page 3 of the specification.

Applicant wishes to point out to the Examiner that Hijzen et al. describes the structure in Figure 9 as being formed with a self-aligned process. See Col. 6, lines 22-23. One of ordinary skill in the art would understand that overlay is not used to refer to a self-aligned process.

Thus, combination of the structure of Hijzen et al. and the device of Farrar will not produce the structure claimed in claims 6-8 of Applicant's invention and Applicant's structure as claimed in claims 6-8 would not have been obvious to one of ordinary skill in the art at the time the invention was made.

Consequently, Applicant submits that the two references cited by the Examiner do not teach, suggest, or render obvious the invention as claimed by

Applicant. In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 6-8 under 35 U.S.C. §103 (a).

Claims 9-11

The Examiner has rejected claims 9-11 under 35 U.S.C. §103 (a) as being unpatentable over Morikawa (US 5,308,682) in view of Bostrom (US 3,731,085).

Applicant respectfully disagrees with the Examiner. Overlay refers to the relative placement of a subsequent layer with respect to a previous layer. See lines 8-9 on page 3 of the specification. For illustrative purposes, the specification chose the polysilicon gate layer (40) as the subsequent or second layer and the shallow trench isolation layer (20) as the previous or first layer. See lines 12-14 on page 3 of the specification.

Applicant wishes to point out to the Examiner that Morikawa teaches vernier scale patterns (see Col. 3, lines 40-41) that serve as an alignment check pattern (see Col. 3, line 14) for multi-level interconnection of **at least three levels** (see Col. 4, line 35-36) (emphases added).

Thus, combination of the structure of Morikawa and the structure of Bostrom will not produce the structure claimed in claims 9-11 of Applicant's invention and Applicant's structure as claimed in claims 9-11 would not have been obvious to one of ordinary skill in the art at the time the invention was made.

Consequently, Applicant submits that the two references cited by the Examiner do not teach, suggest, or render obvious the invention as claimed by Applicant. In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 9-11 under 35 U.S.C. §103 (a).

Claims 1-3, 6, and 12

The Examiner has rejected claims 1-3, 6, and 12 under 35 U.S.C. §103 (a) as being unpatentable over Applicant's admitted prior art (figure 1 and 2 and pg 2-4).

Applicant respectfully disagrees with the Examiner. The Examiner has clearly stated that Applicant's admitted **prior art fails to disclose** a third pair of overlay bars disposed in the layer of material, the third pair of overlay bars being equidistant from a third centerline (emphasis added). The Examiner has not shown why Applicant's structure, as claimed in claims 1-3, 6, and 12, is obvious. The Examiner has merely stated what is being claimed by Applicant as his invention.

In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 1-3, 6, and 12 under 35 U.S.C. §103 (a).

Conclusion

Applicant believes that all claims pending, including amended claims 1, 3-4, 7-8, and 10-11, are now in condition for allowance so such action is earnestly solicited at the earliest possible date.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Once Amended) A structure comprising:

a first pair of features [overlay bars] disposed in a substrate and left exposed,
said first pair of features [overlay bars] being equidistant from a first centerline;

 a second pair of features [overlay bars] disposed in said substrate and left
embedded below a layer of material, said second pair of features [overlay bars]
being equidistant from a second centerline; and

 a third pair of features [overlay bars] disposed in said layer of material,
said third pair of features [overlay bars] being equidistant from a third
centerline, wherein deviation among said first, second, and third centerlines is a
measurement of overlay.

3. (Once Amended) The structure of claim 2 [1] wherein a second separation
between said second centerline and said third centerline is a post-develop
overlay.

4. (Once Amended) The structure of claim 3 [1] wherein a third separation between
said first centerline and said second centerline is an exposed-to-embedded offset
in overlay.

7. (Once Amended) The structure of claim 6 [1] wherein said second pair of features comprises trenches filled with dielectric material and covered with transparent material.
8. (Once Amended) The structure of claim 7 [1] wherein said third pair of features comprises said transparent material.
10. (Once Amended) The structure of claim 9 [1] wherein said second pair of features comprises holes filled with said first opaque material and covered with a second opaque material.
11. (Once Amended) The structure of claim 10 [1] wherein said third pair of features comprises said second opaque material.